

Water Conservation Standards for the Commonwealth of Massachusetts

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Massachusetts Executive Office of Environmental Affairs
Water Resources Commission

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Water Conservation Standards for The Commonwealth of Massachusetts

October 1992

- ✍ Prepared for the Water Resources Commission by the Water Resources Planning Task Force, M. L. Gildesgame, Chairman*
- ✍ This document, including the water conservation standards, was adopted by the Water Resources Commission on October 13, 1992.*

I. Intent and Purpose

The Water Resources Commission adopts these water conservation standards with the goal of fostering policies and practical recommendations that will assist public and private water utilities in achieving the maximum possible efficiency in their water supply systems and in encouraging increasing efficiency by consumers. Efficient water use is consistent with state policy which states that:

- ✍ "water is a valuable resource of the Commonwealth, and as such, the state needs to establish laws and policies to provide for its multiple use, protect its quality and ensure that it is available to meet the legitimate needs of its citizens;*
- ✍ the state's overall goal is to ensure that water is available in sufficient quantity and quality to meet Massachusetts' current and future needs and to accommodate both consumptive and non-consumptive needs; and*
- ✍ it is in the public interest for the state to support and strengthen local capability by working together to plan, construct, manage, and protect water supplies and augment local sources when and where necessary." (Water Resources Commission 1984)*

To assure consistency in state policy, the WRC adopts these recommendations to be used in all programs affecting the planning and management of the Commonwealth's water resources, including the Water Management Act, the Interbasin Transfer Act, the Water Resource Management Planning regulations (particularly the river basin plans produced for the Commission under these regulations), and the Ocean Sanctuaries Act. In addition, water use efficiency standards should be included in all construction, rehabilitation, and facility development activities statewide.

The WRC finds that it is no longer a question of whether water efficiencies can achieve significant benefits for water suppliers and citizens. A number of communities have achieved significant water savings, and the MWRA has increased the efficiency of its water use dramatically in a relatively short period of time. Of equal importance, achieving water use efficiency can provide a measure of protection to the natural resources in the Commonwealth that depend on ground and surface water.

Finally, the WRC emphasizes that conservation is a management tool, or procedure, to realize environmental and economic benefits, such as protecting water supply sources for

future needs, reducing costs for treatment and disposal, reducing system throughput, decreasing the potential for pollution of ground and surface waters, improving service to water supply customers while holding down costs, and helping to protect ground water and surface water levels and flow regimes to protect habitats and the natural functioning of riverine systems.

II. Background and Policy Framework

In 1984, the Water Resources Commission updated the 1978 *Massachusetts Water Supply Policy Statement* which stated, in part, that "the state's overall goal is to ensure that water is available in sufficient quantity and quality to meet Massachusetts' current and future needs and to accommodate both consumptive and non-consumptive needs". The policy supports a balanced approach for providing water supply which includes **long range planning** (within the framework of the WRC water resources management planning regulations), **demand management** (conservation, system management, charging the true cost of water, and establishing enterprise accounts), and **supply management** (protecting and augmenting supplies).

At the same time the *Policy Statement* was being prepared, the Commission was developing two other statements, the *Private Water Supply Policy Statement* (a supplement to the *Policy Statement* which encourages and directs private water suppliers to operate consistently with existing state policies) and the *Components of a Minimum Water Conservation Plan*, adopted by the Commission in 1987.

A key purpose of the *Components* was to help communities develop local water conservation plans and establish minimum standards for conservation, while recognizing individual differences among communities. Since then, the *Components* have had broader application, being used in the review of applications under the Interbasin Transfer Act, the Water Management Act, and other permitting and licensing functions of EOE agencies.

There are several Acts and programs which require conservation measures as conditions for state approval. The 1983 Interbasin Transfer Act requires that proponents demonstrate that "all practical measures to conserve water have been taken". In 1986, the Commission issued interpretive guidelines describing the specifics to be included in "all practical measures".

The 1985 Water Management Act regulations require each applicant for a water withdrawal permit to submit a detailed water conservation program and implementation timetable with the permit application and require that the DEP consider "reasonable" conservation measures as part of the review process. Through the Water Management Act, many communities are being required to include these measures in their water supply planning. The community water needs forecast developed in the River Basin Planning program, which included some conservation assumptions, is considered a "cap" on permitted water use, unless the community can provide evidence to the contrary. During the first five years of the permit, a minimum conservation plan must be implemented, either the applicant's or DEP's, whichever is more stringent. The Water Management Program targets conservation plan implementation as one area for review at the end of the first five years of the 20-year permit. In addition, some DEP grant and

permit programs require that communities file a water conservation plan with the Water Resources Commission by 1994.

The Massachusetts Water Resources Authority has been implementing a number of important water efficiency/conservation measures which have resulted in significant reductions in overall demand on their system and by communities in their service area. Individual towns and cities both within and outside the MWRA area also have taken steps toward more efficient water use by domestic and non-domestic users.

III. Development of the Standards

In 1990, the Water Resources Planning Task Force of the WRC held a six-month series of discussions with the goal of developing practical strategies to implement water conservation statewide at the local level, primarily outside the MWRA service area. The goal of that series, as well as the following new standards, was to develop policies and specific recommendations that will assist Massachusetts suppliers to achieve the maximum possible water efficiency in their public water supply systems, homes, factories, and other places of business.

The group reviewed the practical suggestions of a number of public and private agencies in carrying out conservation programs. Part of the review included an assessment of the conservation components in the Interbasin Transfer Act, the Water Management Act and the Ocean Sanctuaries Act amendments.

In 1991, Peter C. Webber, DEM Commissioner and Chair of the WRC, requested the Office of Water Resources and the Water Resources Planning Task Force to develop a water conservation initiative, and in the spring of 1991, the Water Resources Commission began a reassessment of the key components of the river basin planning program, including the importance of integrating conservation into the plans.

The coincidence of these efforts has led to a broad review of water use efficiency/conservation by the Water Resources Planning Task Force and to the present policy initiative for the development of revised standards. With the help of a Tufts University student intern, Andrew Hyman, it was possible to gather the available conservation practices and recommendations from many sources and summarize the major recommendations in table form. Those draft recommendations were sent to a wide spectrum of interested parties for corrections and critique, including to those who took part in the Task Force presentations, state agencies, consultants, and others.

The Task Force reviewed the recommendations, and with the assistance of another student intern, Caleb Spinney, from the University of Massachusetts at Amherst, the responses to the draft recommendations were incorporated into draft Water Conservation Standards. This draft went through a careful and deliberate review and refinement process by both the Task Force and the Commission.

IV. General Policy Recommendations

A central concern that arose in all the Task Force and Commission discussions was how to implement water efficiency and conservation measures at the local level. Over the years, many good suggestions and programs have been developed, and many communities have made good efforts; other communities have not. Because efficient systems make good sense both economically and ecologically, the goal is to encourage communities to implement efficiency measures, whether or not they apply for a water withdrawal permit or interbasin transfer approval. While each community should use appropriate measures to enhance its current conservation efforts and programs, implementing most efficiency measures will require capital outlay and some changes in municipal management practices. In order to support expenditures, especially in difficult economic times, and to achieve these management changes, citizens need to clearly understand that measures to increase efficiencies in their water supply systems are likely to pay for themselves in a reasonable period of time, will result in more reliable systems, and will reduce negative impacts on the environment.

A first and fundamental recommendation, therefore, is to place a major emphasis on **education** for the general public and municipal officials about the importance of efficient water use. As one study noted a dozen years ago,

the ultimate implementation of water conservation measures will be the responsibility of citizens whether within their private residences or within the public or private commercial or industrial institutions where they are employed. The initial basic foundation of water conservation efforts is to acquaint the public with the benefits, costs, and techniques of water conservation. Once the general public is aware of the economic and environmental benefits which can be redeemed through water conservation the prospects for successful implementation will be significantly increased. *(New England Interstate Water Pollution Control Commission 1979)*

In order to facilitate the statewide implementation of these measures, it is recommended that the position of **State Water Conservation Coordinator** be established in the Executive Office of Environmental Affairs to work with water suppliers, industries, watershed associations, and other local entities as well as with existing state programs in the Office of Technical Assistance, the Department of Public Utilities, the Division of Energy Resources, the Water Management Act Program in DEP, the River Basin Planning Program in DEM, the MWRA, and the Riverways Program in DFWLE. A similar position, which existed within the EOE Water Resources Commission staff, now is frozen due to budget considerations. The Coordinator would be responsible for outreach, education, coordination, and technical assistance to water suppliers and other community officials, industry associations, local volunteer groups, schools, and others who have or might provide a venue to promote the standards.

To facilitate this interchange, it is recommended that each community name a **Community Water Conservation Official**. Because a water efficiency program needs to be tailored to the specific conditions and needs of each community, this individual will play a key role in working with state and regional officials to set up or augment programs and projects.

It is further recommended that each community develop a **local water resources management plan**, as envisioned by the Water Resources Commission, which should provide the framework within which local water resources planning takes place. In January 1990, the Commission published "Guidelines for Preparing a Local Water Resources Management Plan" which included a Water Supply Questionnaire, a Local Water Conservation Plan, and a Concept Plan for protection and management of community water resources. Most suppliers have filled out a questionnaire, and an increasing number have completed the conservation plan. Communities also should be encouraged to complete the Concept Plan as it forms an important element in planning for wise use of community water resources.

The comprehensive local plan should include an analysis of all non-domestic water users to evaluate the current level and categories of water use and to identify specific opportunities to reduce consumption. The local plan also should include long range planning for system maintenance, source protection, and, as necessary, new source development. Where possible, water surveys should be made available to domestic users to evaluate the efficiency of their homes and as a way to attenuate increases in water bills where water rates are going up. Water suppliers should also conduct water system audits to provide a clear understanding of the types of demand, seasonality of demand, unaccounted-for water, condition of the distribution system and other aspects of the system.

It is recommended that each community establish an enterprise fund or other means to achieve **full-cost pricing** in which users would pay the real cost for water. The funds raised through rates would only be used for water management; there would be no subsidies of water rates through taxes, and no other municipal agency could use water revenues. The establishment of an enterprise account is described in M.G.L. chapter 40, section 39k.

In order to provide an example for the communities in the Commonwealth to undertake water use efficiency programs, it is recommended that **demonstration projects** be set up in selected state facilities with heavy public use, and eventually at all state facilities. Manufacturers and others might be asked to donate toilets, shower heads and other equipment to the program. When the public visits rest rooms, for instance, there would be signage explaining savings in water volume and dollars from the low flow toilets, zone controlled water temperature, and other water saving features that could be used in the home or business. Similar demonstrations could show the benefits of leak detection and infrastructure repair and retrofit in large and small buildings. Ideal locations might include State Parks, Forests, rinks, pools, recreation areas, and visitor centers. In this way, the state would accomplish two important goals: implementing existing state policies and educating the public on water conservation.

By working through trade or industry associations and the Office of Technical Assistance, similar demonstrations could be located in small commercial locations to show the cost effectiveness of efficiencies for these users. Large commercial and industrial users, such as Gillette and Polaroid, have demonstrated the savings that can be achieved, and these experiences should be part of the public education effort directed at these users.

It is important to note that the Division of Capital Planning and Operations (Executive Office of Administration and Finance) has been promoting water conservation in state facilities, and a closer working relationship should be established to coordinate efforts. As the state agency responsible for property management, renovation, and construction of state facilities, DCPO has taken significant steps to reduce water use. Actions taken include development (with DEP) of a water conservation assessment program for state facilities; a set of pilot water conservation audit, design, and construction projects designed to save over 20 million gallons of water annually; development of a statewide blanket contract for the procurement of water saving devices; incorporation of water conservation into renovation projects; and distribution of educational information to facility managers and in-house education for engineering staff.

DCPO's privately financed shared energy savings projects provide good example of what can be achieved with **public-private cooperation** and should be examined for applicability to water. DCPO's programs have resulted in the installation of new capital equipment at no cost to the Commonwealth and have resulted in significant net savings to the Commonwealth in energy costs. Utility funded programs coordinated by DCPO have brought in capital investments and have realized significant savings to the Commonwealth. DCPO recently secured legislative authorization to procure water conservation improvements through the Shared Savings Program. Consequently, all future shared savings Requests for Proposals will require contractors to evaluate water conservation opportunities.

In summary, implementing water use efficiency measures has been shown to be cost-effective in achieving economic and environmental benefits. Increasing the level of efficiency of a water supply system can help communities avoid supply shortages; can reduce the need for capital expenditures to develop and treat new supplies and wastewater facilities; and can provide significant benefits to water-dependent ecosystems by reducing consumptive withdrawals of water. Therefore, the General Recommendations of the Water Resources Commission are to:

1. Educate the general public and municipal officials about the importance of water use efficiency/conservation and the new standards;
2. Name a state water conservation coordinator in EOEA to help promote the new standards and coordinate local efforts;
3. Emphasize water use efficiency/conservation as a role of the local water conservation official;
4. Emphasize the importance of the local water resources management plan as a tool to implement the new standards;
5. Encourage municipal water suppliers to charge the full cost of water and to operate on water supply system revenues, preferably through an enterprise account; and to
6. Develop water use efficiency/conservation demonstration projects at state facilities, with public-private cooperation wherever feasible, to educate the public

and promote the goals of these standards and recommendations.

V. Water Conservation Standards and Recommendations

A. Objectives

The following standards and recommendations are intended for adoption statewide by all water suppliers and users, including individual consumers, businesses, industries, and public agencies. The standards are part of existing state policy, as set out in the Water Resources Commission "Water Supply Policy Statement", and already have been adopted by many water suppliers and consumers.

The goals for each of the topics shown below should be included in all planning, technical assistance and other programs and functions of state government as a means to increase statewide awareness of and to promote the implementation of the standards and recommendations as broadly as possible. In addition, the goals also should be integral components of regional and local land use management and environmental protection activities.

Each topic contains **standards**, which are achievable, implementable, and practical measures that should be adopted by water suppliers, small and large water users, and EOEa agencies in carrying out their water resources planning and management programs, as well as other state agencies in issuing permits or approvals that involve water use. While the standards are applicable in a wide range of regulatory and non-regulatory situations, agencies have flexibility in selecting those standards appropriate for their programs. For instance, it may be that requiring a specific billing or meter reading schedule is beyond the scope of the Water Management Act permitting process, but may appropriately become a condition of approving an interbasin transfer application. Thus, the goals for the standards are stated comprehensively to promote consistency and facilitate cooperation among agencies, but each agency will determine how the goals are to be met. In the same way, each water supplier and user should choose the combination of measures that best meets the water conservation goals.

In addition, there are **recommendations** which should be considered and adopted wherever possible, particularly by communities in developing and implementing their local water resource management plans. In contrast to the standards, these recommendations may not be as widely achievable, implementable, and practical at the present time due to economic or technical reasons. The recommendations are important in that they should be considered goals for the future and indicate the trend that should be followed.

In sum, the overall objectives of these standards and recommendations are:

- ✍ to maximize water conservation to the benefit of environmental resources, state and local economies, and individual consumers;
- ✍ to make water resource conservation a priority in all water related decision-

making in the Commonwealth;

- ✍ to reduce or eliminate the waste of water through appropriate water supply management practices;
- ✍ to promote conservation of water resources by all consumers through the introduction of technology, methods, and procedures designed to increase the efficient use of water;
- ✍ to encourage innovations in technology, policy, and management.
- ✍ to maximize the efficient use of existing supplies prior to allocating additional resources; and
- ✍ to promote public awareness of the long-term economic and environmental benefits of conserving water.

Finally, while these standards and recommendations reflect the most current technical and operational knowledge about water use efficiency, the Water Resources Commission should

- ✍ review these objectives, standards, and recommendations at least every five years to insure that they keep pace with relevant changes;
- ✍ regularly monitor progress toward implementation;
- ✍ look at means to overcome impediments to implementation, such as the issue of making water and sewer fees tax deductible on income tax at both the state and federal levels to encourage the adoption of full cost pricing and enterprise funds at the local level; and
- ✍ investigate means of providing incentives for implementation, such as allowing agencies to retain the value of energy and water conservation savings in their budgets.

B. Water Conservation Standards and Recommendations

1. Public Education

Goal: *To promote public awareness of the long-term economic and environmental benefits of conserving water as a basis for the adoption of measures to achieve greater efficiency in using water and conservation of water resources.*

Background: Public education is more than simply information dissemination; it is a key to getting public support by providing the basic understanding of sound water resources management and planning and explaining the associated economic and environmental benefits. In addition to the general public, the Conservation Coordinator should provide education to Boards of Selectmen, Water Commissioners or Superintendents, and others in policy-making positions or with line responsibility for carrying out the water conservation programs. Materials for education programs should be sought from the Massachusetts Water Works Association and the New England Water Works Association and other organizations and be funded by local water revenues.

Because public education depends on accurate data, the WRC supports a review of existing mechanisms for obtaining water use statistics from water withdrawers and other measures to develop/collect, disseminate, and interpret water resources data and provide technical assistance to communities.

Three main areas of emphasis for an educational program are:

- Explaining to water users all the costs involved in providing water, including planning, engineering, construction, operation, maintenance, treatment, wastewater facilities costs, piping, leak detection, compliance costs, salaries, protection costs, pensions, health care, staff training, public education, and other costs.
- Showing that investments in efficiency and conservation will provide water users with long term savings compared to a utility's costs of having to develop and treat new water supply sources and develop wastewater treatment facilities. For example, through a domestic device retrofit program, including follow-up visits or mailings, water suppliers can make customers aware that making a few simple changes can provide tangible savings.
- Highlighting the environmental benefits of reducing water demands, including the relationship of ground water to surface water and the potential impacts of withdrawals on instream uses, such as habitats for fisheries and other wildlife and water-based recreation; the relationship between pumping and salt water intrusion for coastal areas; and the relationship between water quality and streamflow.

Standards: Because an almost infinite number of specific methods for information dissemination are available, no specific standards are stated, except that each community should develop and implement an education plan which should include most, if not all

items in the following basic list. Water users and agencies should choose from these and other resources to create and implement programs best suited for their particular situation.

- The largest users should be targeted early on to realize the greatest potential savings and to demonstrate the benefits of a conservation program.
- Public Education should reach to the schools; develop/use media that will appeal to children, including getting them involved with environmental/ water resources projects and field trips.
- Bill Stuffers and/or bills should have a work sheet on the reverse to enable customers to track water use and conservation efforts and figure the dollar savings
- Public space advertising/media stories on successes (and failures)
- Conservation information centers, perhaps run jointly with electric or gas company.
- Speakers for community organizations
- Public service announcements; radio/T.V./audio-visual presentations on supply sources and current status
- Joint advertising with hardware stores to promote conservation devices.
- Use of civic and professional organization resources
- Special events such as Conservation Fairs
- Multilingual materials should be available as needed
- Contests and recognition for innovation could be incorporated into the public education program.
- Information on xeriscaping, gardening, and lawn care practices.

2. Leak Detection and Repair

Goals: *To perform regular leak detection and promptly repair all leaks.*

Background: Detecting and fixing leaks can provide one of the largest returns on investment, especially in older systems, and should be carried out by all water suppliers. This should be a key ingredient in public educational programs, using crews in the street as a point of attention by media.

Standards:

- 1 A full leak detection survey of the distribution system should be completed every two years.
- 2 Leak detection and repair should be recognized as expenses of the water supply system and included in a full-cost pricing structure.

Recommendations:

- Because leak detection requires substantial skill, regularly trained, in-house teams are recommended; communities should investigate the advantages of sharing leak detection equipment and personnel to reduce costs.
- NEWWA and MWWA should be approached by DEP to consider providing standardized training and certification in leak detection and repair.
- Pressure reduction should be considered by suppliers for implementation where technically feasible and consistent with public health and safety considerations.
- There should be consideration given to assuring the penalty for water theft equals that of gas or electric theft.

3. Metering

Goals: *To meter all residential, commercial, institutional, agricultural and municipal users of water supply systems and to bill them or otherwise account for their water use at least quarterly.*

Background: Complete system metering lets customers know how much water they are using, provides the supplier with valuable knowledge of customer use patterns, assists in demand management programs, and enables the supplier to bill the customer accurately. With accurate knowledge about current demand, the supplier can more effectively identify potential water savings, assist specific users to implement water saving measures, thereby providing the opportunity to reduce overall system demand and plan efficiently for system growth. Metering costs should be recovered through water rates.

Standards:

- 1 Each public water supplier should develop a program to implement 100% metering of all public sector and private users with meters of proper size and accuracy to ensure full registering of water flow.
- 2 The metering program should include regular meter maintenance, including testing, calibration, repair, replacement and checks for tampering to identify and correct illegal connections.
- 3 The metering program should include regular meter reading of all public sector users and regular accounting of their use (see Public Sector Water Use).
- 4 Meter reading and billing for domestic accounts should be done quarterly, with the understanding that customers should be billed on actual meter readings.
- 5 Master meters (which register the flows in the municipal system) should be calibrated annually.

Recommendations:

- Meter reading and billing for the largest users should be done more frequently than domestic accounts (for instance, billing should be monthly for the largest users); and meter maintenance should be more frequent.
- Exterior meter reading devices should be installed to improve the efficiency of meter readings.
- Meter reading and billing frequency would be most effective if done on a monthly basis, but unless a community has or develops the means to read the meters remotely, it may not prove cost-effective to read meters on a monthly basis.
- Suppliers should consider a 10-15 year period for meter replacement

4. Pricing

Goals: *To charge the full cost of providing water and to adopt a rate structure that encourages water conservation.*

Background: Full-cost pricing refers to price levels which recover all the direct and indirect costs associated with providing water. For all sectors of water use, knowing the costs associated with providing water and sewer services creates an appreciation of the importance of conserving water and promotes greater understanding of the direct relationship and environmental implications of individual water use and community water resources, especially during seasonal or drought shortages.

Standards:

- 1 The water pricing structure should include the full-cost of operating the water supply system, including but not limited to:
 - pumping, maintenance, electricity/fuel
 - treatment and associated treatment plant costs
 - distribution system operation, repair, and maintenance
 - watershed purchase/protection, well site purchase/protection, aquifer land acquisition
 - capital replacement fund, capital depreciation account, and debt service
 - purchase and installation of water conservation/retrofit devices
 - All aspects of a public education program including purchase and distribution of educational materials and related staff time
 - hiring staff to run the water supply system, staff benefits package, and staff training and professional development
 - leak detection and repair
- 2 Water supply system operations should be fully funded by water supply system revenues.
- 3 Each water supplier should regularly evaluate existing rate structures, including any peak demand and seasonal pricing components. In addition, the water supplier should consider all possible pricing options, such as increasing block rates, to enhance system reliability by encouraging efficient water use by consumers, particularly during periods of supply limitation.
- 4 Water and sewer rates, where applicable, should be billed so as to inform customers of their actual use and the cost of each; billing should be carried out at least quarterly (see Metering). The cost of reading and billing should be shared between the water and sewer operations.

Recommendations:

- Each water supplier should establish an enterprise account for water.
- Water suppliers should consider adopting increased seasonal rates to moderate peak demands and/or to protect/maintain supply levels.

5. Residential Water Use

Goals: *To promote the efficient use of water and water conservation practices; to reduce daily and seasonal peak water use; and to promote public awareness of the economic and environmental benefits of water conservation.*

Background: Residential water use from public water suppliers in Massachusetts amounts to about 450 million gallons per day. Increasing efficiency of use and implementing conservation measures can realize significant savings for consumers and suppliers both in energy and water costs.

Standards:

- 1 Water suppliers, in cooperation with manufacturers and professional organizations, should make available to residential users at least the following water saving devices: low-flow shower heads; faucet aerators, toilet displacement devices and/or low-flow toilets, toilet leak detection kits; and educational literature about installation and water conservation savings (in gallons and dollars), including outdoor watering and xeriscaping.
- 2 The state plumbing code should be strictly and consistently enforced at the local level.

Recommendations:

- In order to ensure proper installation and greater payoff of retrofit devices, professional installation is recommended.
- Statewide efficiency standards should be legislatively set for appliances.
- The decision to use grey water, small irrigation wells, and rain water from roof catchment systems should be consistent with existing state laws and should be made at the local and regional level by local boards of health and regional state water quality staff. Xeriscaping or use of native vegetation should be encouraged.
- Water audits should be made available to residential customers, especially as a means to avoid "rate shock" where rates are increasing.

6. Public Sector Water Use

Goals: *To implement and emphasize water conservation in government buildings and facilities as demonstrations of water saving techniques and concepts to the public; to accurately account for public sector water use through metering.*

Background: Public municipal and state buildings and facilities should serve as demonstrations of water saving techniques and concepts. The public should be aware that the state and municipalities are not only doing their part, but leading the way.

Standards:

- 1 Government facilities, including school departments and hospitals should account their full use of water, based on full metering of public buildings, parks, and other facilities.
- 2 Public buildings should be built or retrofitted with equipment that reduces water use, such as faucet aerators, low flow shower heads, toilet displacement devices or low flow toilets, and self-closing faucets. Water saving devices and measures should be well identified to users of public buildings and facilities.
- 3 Water used by contractors using fire hydrants for pipe flushing and construction should be metered and they should be charged, including service fees.
- 4 Irrigation of municipal property should be sensitive to soil moisture or should be subject to operational procedures that avoid watering during the hottest part of the day (10 am to 6 pm) or during precipitation events.
- 5 Strictly apply plumbing codes and incorporate other conservation measures in new and renovated buildings.

Recommendations:

- Encourage manufacturers to provide water saving devices to municipalities for demonstration projects for free or at reduced cost; master water temperature regulation should be considered for public buildings.
- Encourage xeriscaping or use of native vegetation to reduce outdoor watering; emphasize the advantages of drip irrigation over broadcast watering, and promote these measures in educational campaigns.
- Investigate the potential uses of non-potable water supplies and small irrigation wells for landscaping, street cleaning and building washing, within the public health considerations, existing cross connection programs, and plumbing board decisions.

7. Industrial, commercial, and institutional water use

Goal: *To increase the efficiency of industrial, commercial, and institutional water use through the use of best available water saving technologies, such as process water recycling/reuse, improved maintenance techniques, and elimination of once-through cooling.*

Background: The bulk of industrial, commercial, and institutional water use is for heating, cooling, and processing, but often includes an appreciable sanitary and landscaping component. Conservation measures must be tailored to reflect the type of water use and characteristics of individual facilities. The implementation of source reduction programs often is accompanied by a reduction in facility water uses as well as a reduction in pollutant discharge. Water conservation can be built into an industry's strategy to comply with sewer and NPDES discharge requirements and often results in monetary savings following short pay-back periods.

Different approaches to achieving these standards are needed for companies which are self-supplied and those which receive water from private or municipal suppliers, water districts or fire districts. Those users who have their own wells or surface supplies can be required to comply with these standards as conditions of a Water Management Act permit, interbasin transfer approval, or other regulatory process. Because municipalities usually have no statutory basis for mandating specific conservation measures or other operations in a particular industry or plant, unless those practices are part of the plumbing or other codes, those receiving water from a private or public supplier should consider the standards as goals or recommendations.

Standards:

- 1 All industrial, commercial, and institutional water users should develop and implement a written water policy, addressing among other items: demand management, leak detection and repair, a program of preventative maintenance, and a program of employee education.
- 2 All industrial and commercial water users should carry out a water audit to determine the location and amount of water used for heating, cooling, processing, sanitary use, and outdoor use. The audit should serve to identify functions, activities, and locations where water savings could be readily achieved and the extent to which equipment, fixtures, and maintenance changes and/or process, heating and cooling modifications could reduce or eliminate unnecessary water use. Findings from the audit should be the basis for actions to conserve water.

These actions could include closed loop cooling, use of non-potable water (in conformance with plumbing code and DEP regulations to assure safe drinking water and to avoid cross connections), use of heat-sensitive valves to control cooling equipment, replacing water cooling with air cooling (where possible within air quality standards), installation or retrofit of sanitary water devices, meter maintenance and calibration, and xeriscaping.

- 3 In new and renovated buildings, comply with plumbing codes and use the best available technologies for water conservation.

Recommendations:

- Trade associations or other entities should consider contests and awards for water saving ideas which demonstrate financial benefits and competitions between businesses regarding discharge reduction and maximum reuse.
- Develop a system to reward employees for water saving suggestions.
- The EOEa Office of Technical Assistance should be reinforced in its efforts to provide technical assistance to companies and large water users; OTA should work with industry groups and suppliers; this might include industry specific workshops on conservation or training workshops on how to conduct water audits for industries and suppliers.
- All industrial, commercial, and institutional users should install/retrofit water saving sanitary devices, including but not limited to low-flow shower heads, faucet aerators, toilet displacement devices, and/or low flow toilets.
- Industrial and commercial users should work with code officials, standards committees, state programs, manufacturers, and legislators to promote water conservation and efficient use.

8. ~~Water Supply System Management~~

Goals: *To increase system efficiency and to integrate conservation measures into long-term water supply planning and management.*

Background: Public water suppliers have many options for improving the efficiency of their operations and encouraging water conservation by consumers. The Local Water Resources Management Plan developed by the Water Resources Commission can provide a framework for implementing these standards and establishing long-term priorities and plans for system maintenance, source protection, and, as necessary, new source development.

Standards:

- 1 Municipalities should develop regulations, by-laws, or ordinances which can be imposed in the event of a water supply emergency. These drought emergency plans, once approved by DEP, will enable suppliers to use existing supplies in a planned manner during times of limited availability.
- 2 Water suppliers should develop strategies to reduce daily and seasonal peak demands and should develop contingency plans to ameliorate the impacts of drought, seasonal shortages or other non-emergency water supply shortfalls.
- 3 Water suppliers should carry out water supply system audits every three to five years to determine where water can be saved and the effectiveness of existing water conservation practices.
- 4 Water suppliers should develop and regularly update a plan to identify all uses of water, both metered and unmetered uses; how much water is unaccounted for, and how they plan to recover the lost water.
- 5 Water suppliers should develop and implement a program to comply with these Conservation Standards and, where possible, the Recommendations in the operation and management of their water supply systems.
- 6 Water suppliers should investigate and develop plans for interconnections with other systems for emergency supplies.

Recommendations:

- Communities should develop a local water resources management plan consistent with WRC recommendations and should update it periodically.
- To aid in community planning and decision-making, water suppliers should keep local officials (Conservation Commission, Zoning and Planning Board, Selectmen, and other agencies concerned with development) regularly informed of water consumption and supply availability.
- Communities should adopt municipal by-laws and local health regulations that require commercial, industrial, and institutional water users to carry out regular

water audits.

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